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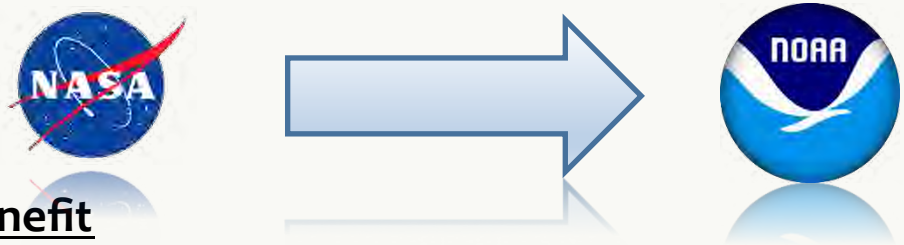
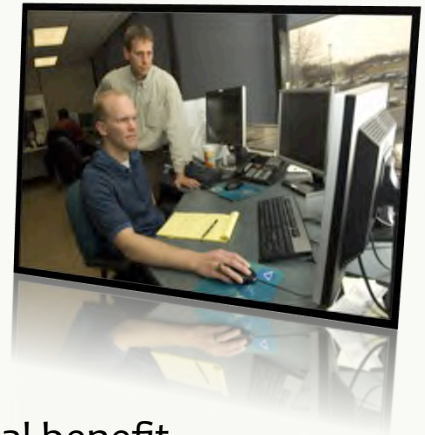
Short-term Prediction Research and Transition (SPoRT)

SPoRT is focused on transitioning unique NASA and NOAA observations and research capabilities to the operational weather community to improve short-term weather forecasts on a regional and local scale.

- close collaboration with numerous WFOs and National Centers across the country
- SPoRT activities began in 2002, first products to AWIPS in 2003
- co-funded by NOAA since 2009 through satellite "proving ground" activities

Proven paradigm for transition of research and experimental data to "operations"





Benefit

- demonstrate capability of NASA and NOAA experimental products to weather applications and societal benefit
- prepares forecasters for use of data from next generation of operational satellites (JPSS, GOES-R)

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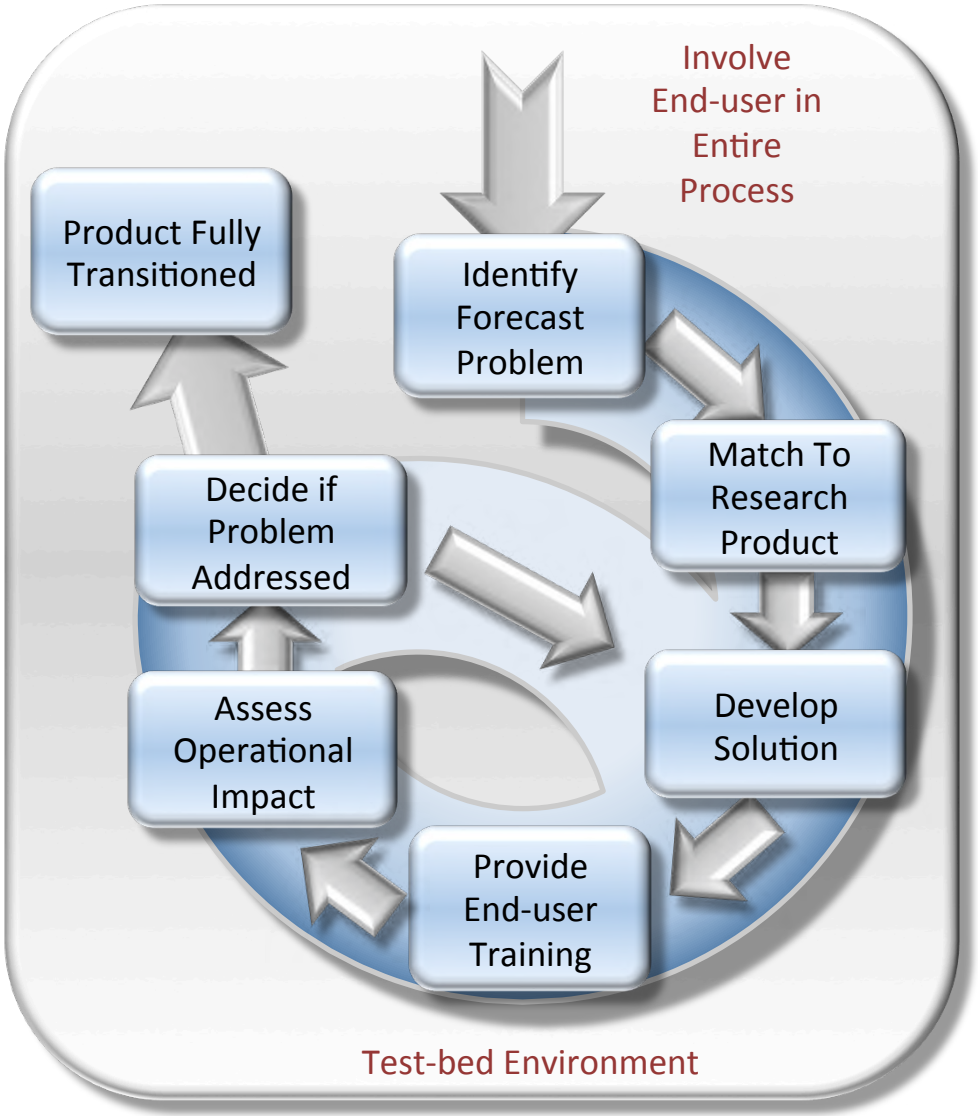
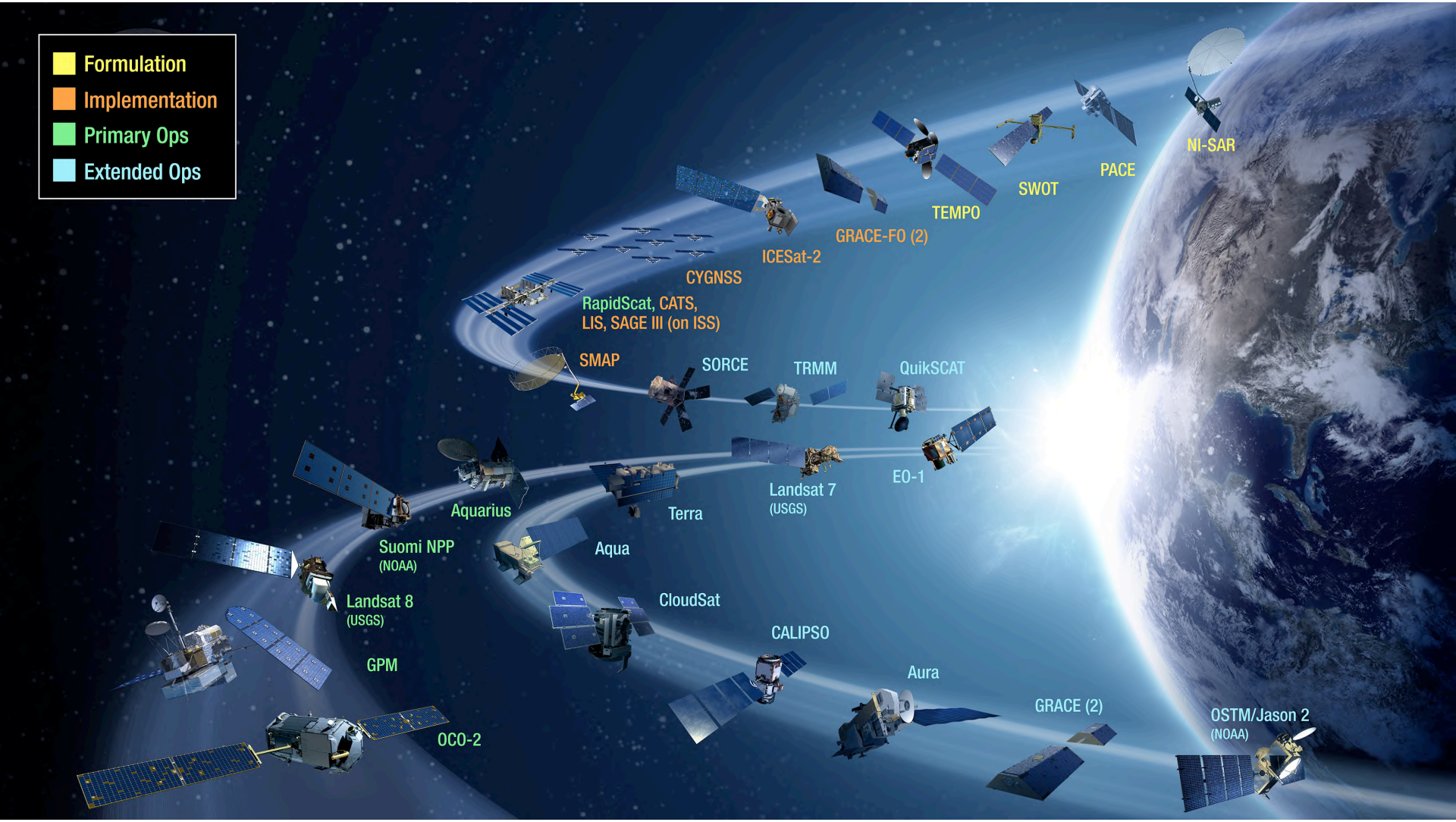
SPoRT's Research to Applications Paradigm



Current and Future NASA Missions



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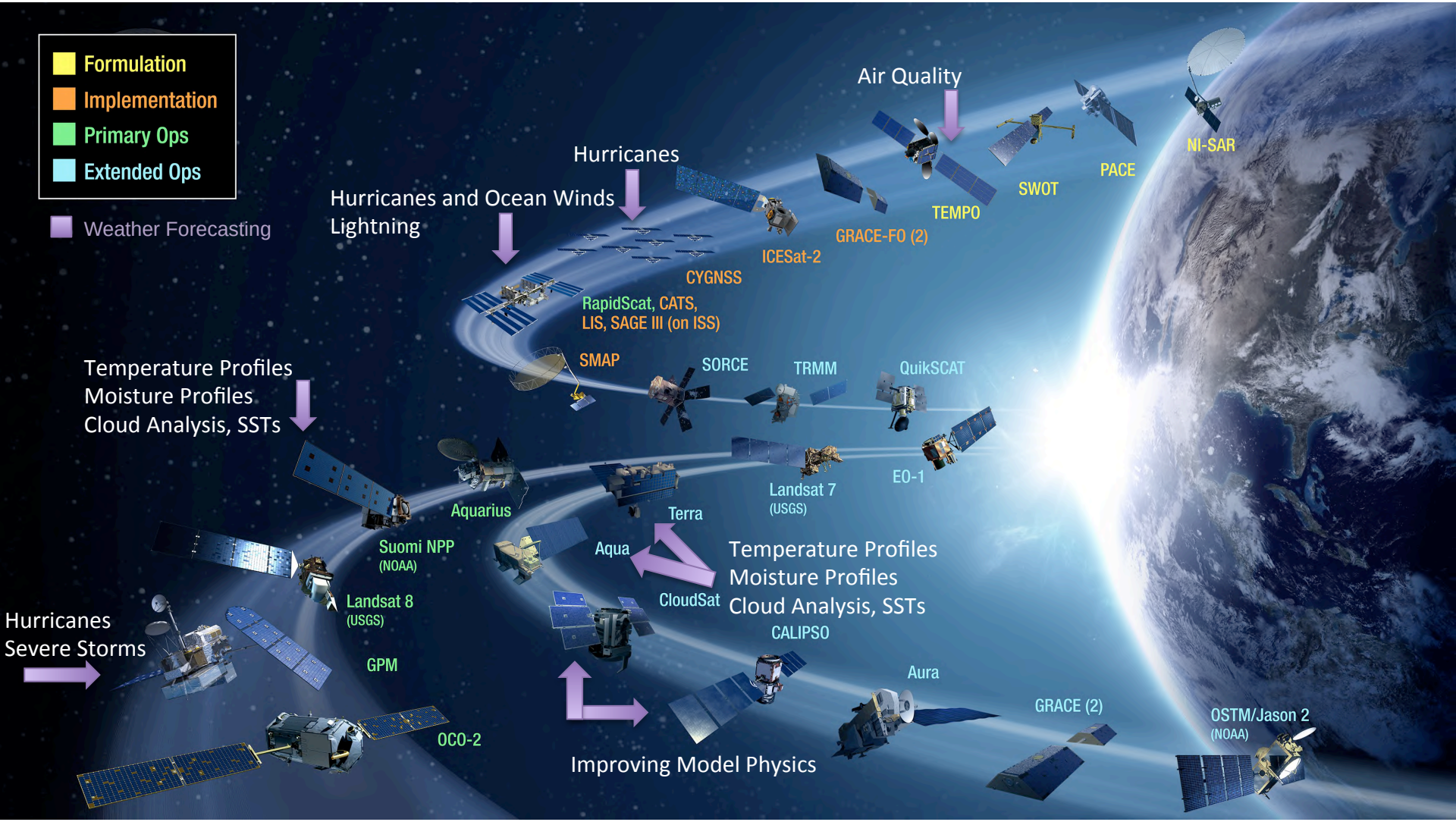
NASA Missions and SPoRT Applications



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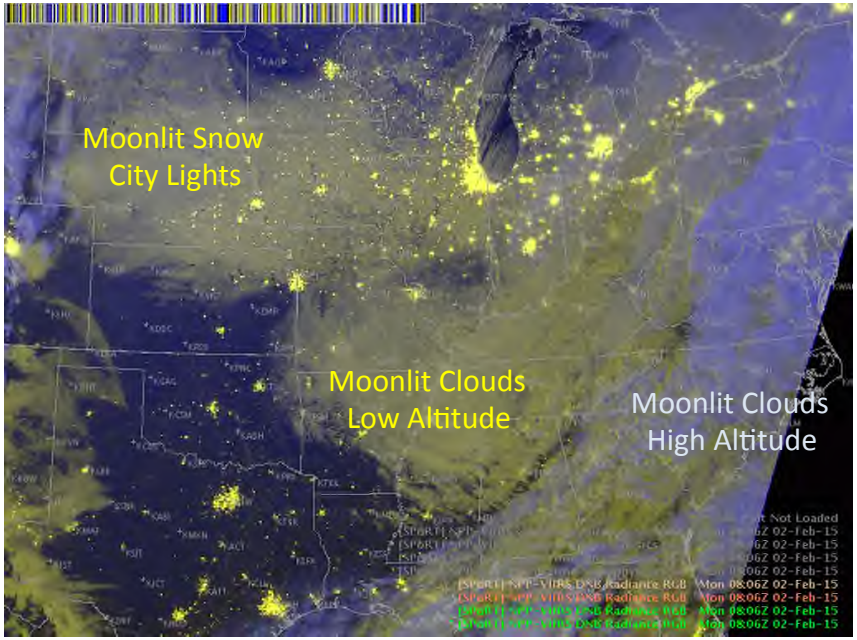
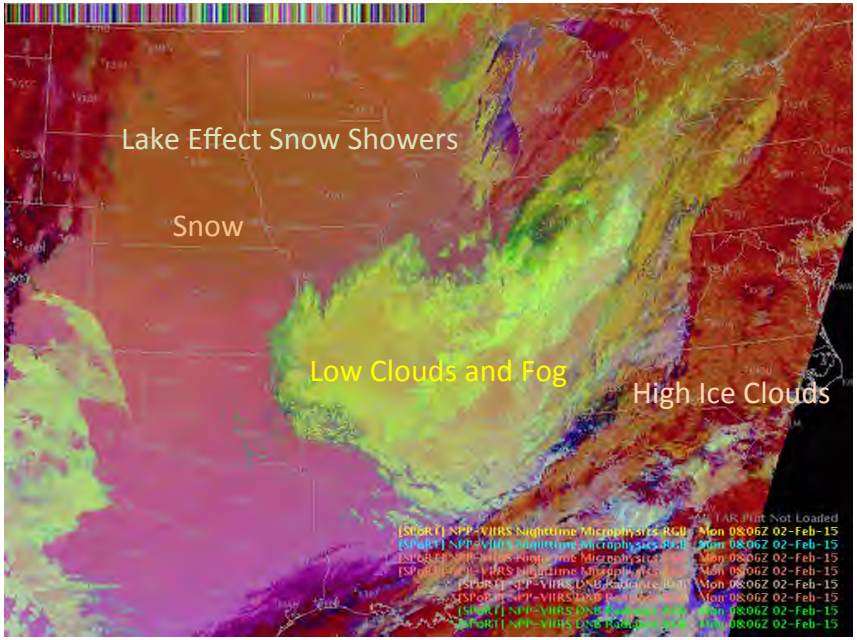
Weather Analysis and Forecasting



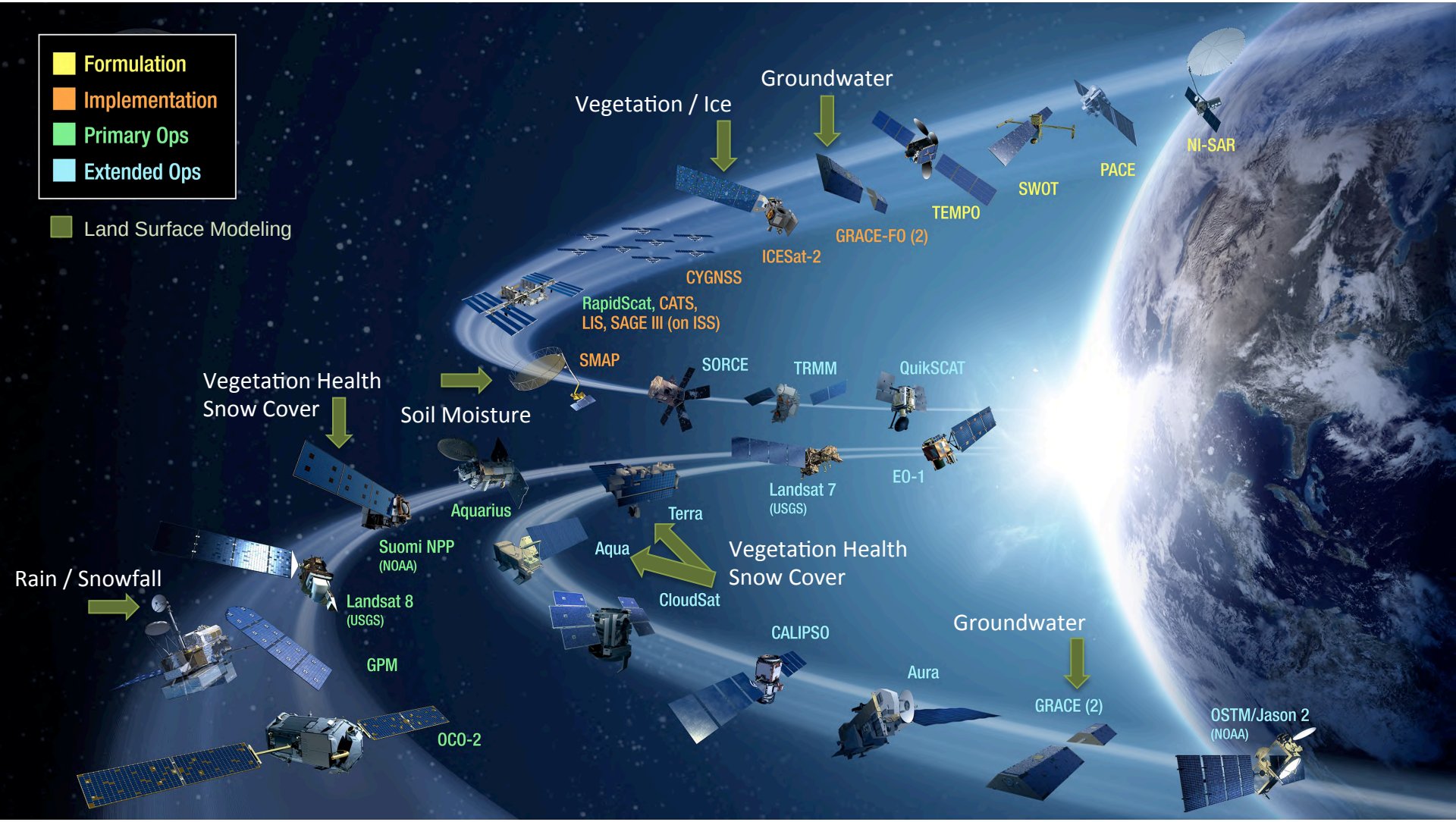
Suomi NPP VIIRS day-night band combined with infrared temperatures



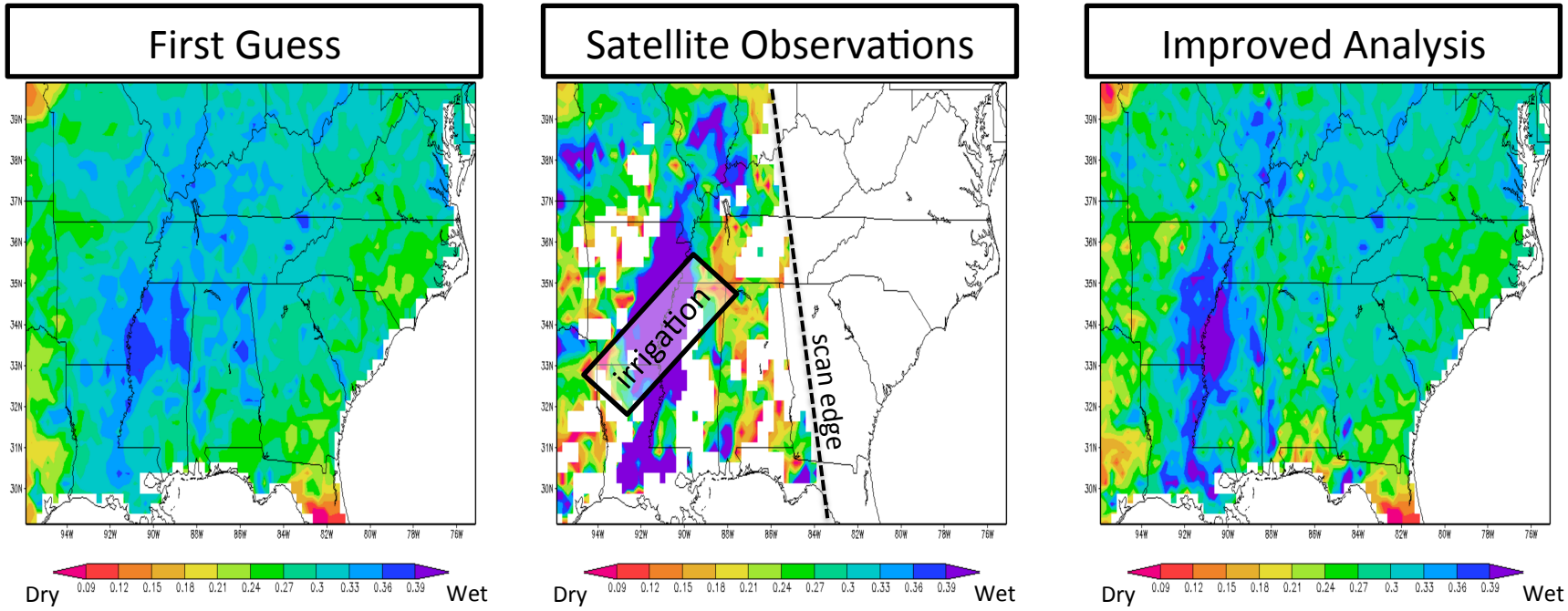
Suomi NPP VIIRS multi-spectral composite to highlight low clouds

SPoRT uses current NASA and joint NASA/NOAA missions to demonstrate future capabilities of NOAA operational satellites. Here, multiple types of VIIRS observations are combined into a single image to discriminate cloud and land surface features.

NASA Missions and SPoRT Applications



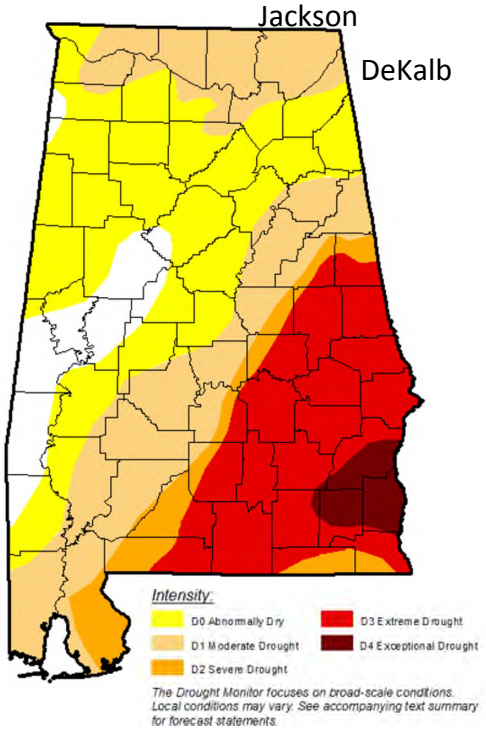
Soil Moisture Applications



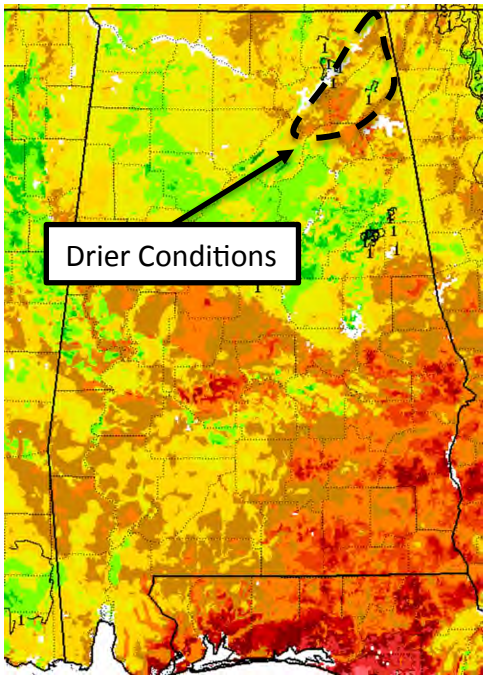
Improved analysis of soil moisture through data assimilation

The recent launch of NASA's Soil Moisture Active Passive (SMAP) mission allows improved sampling of soil moisture. Here, SMAP-like data captures the effects of irrigation on soil moisture, which can also impact the prediction of temperature and precipitation.

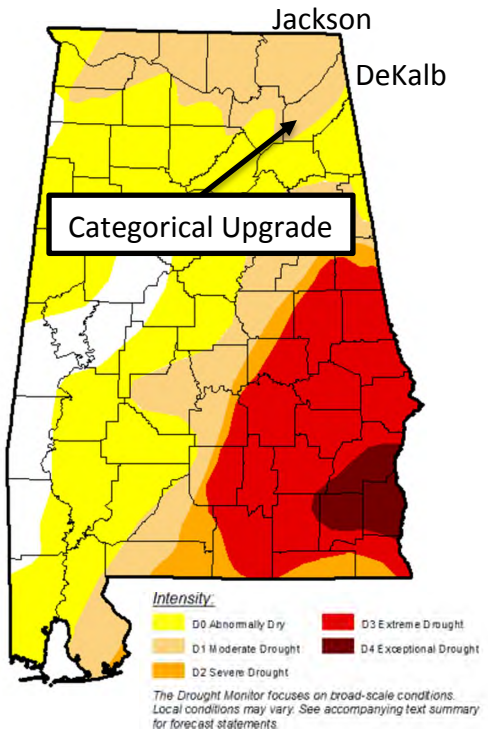
Soil Moisture Applications



U.S. Drought Monitor
May 1, 2012



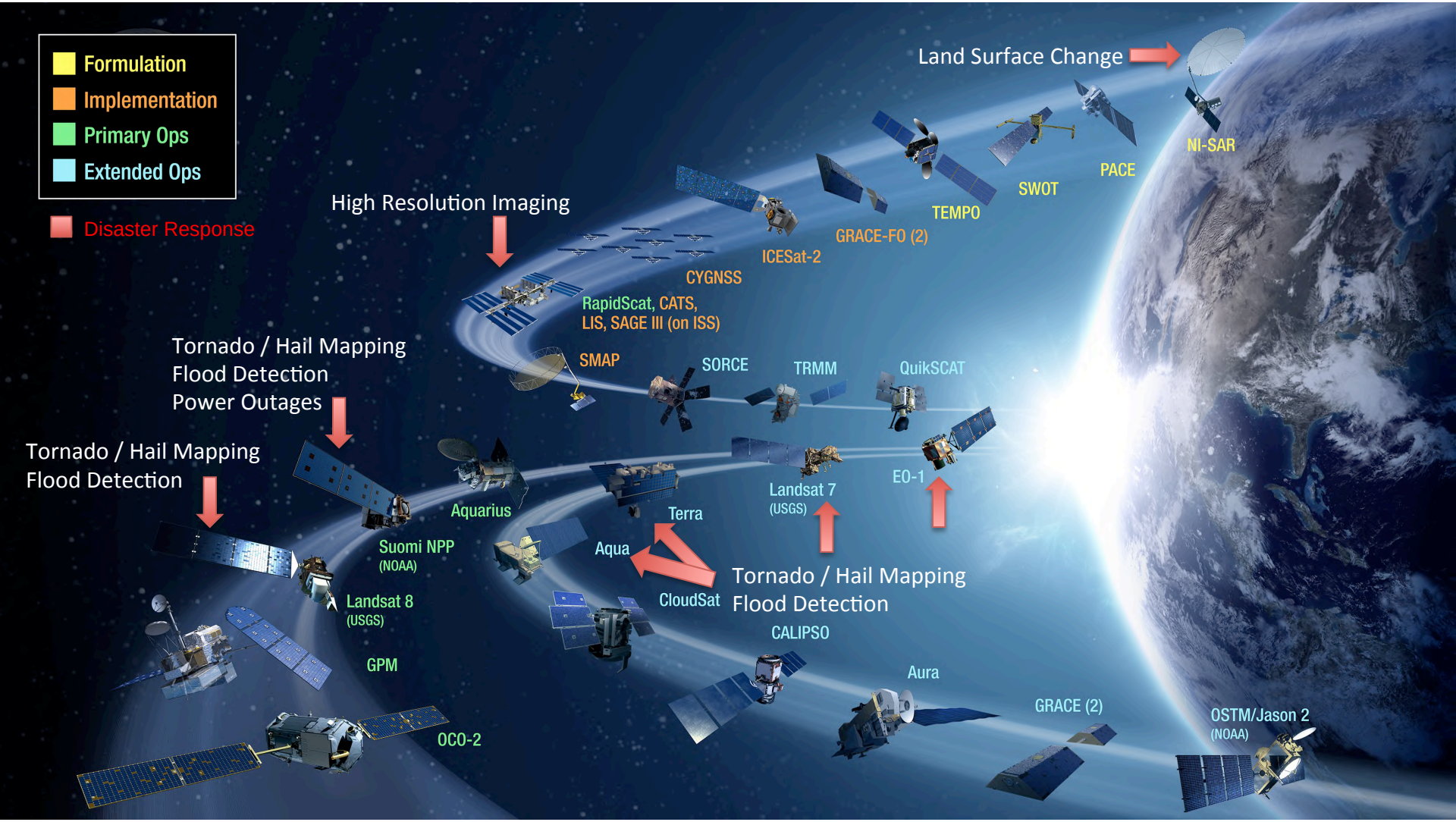
Simulated Soil Moisture
NASA Land Information System



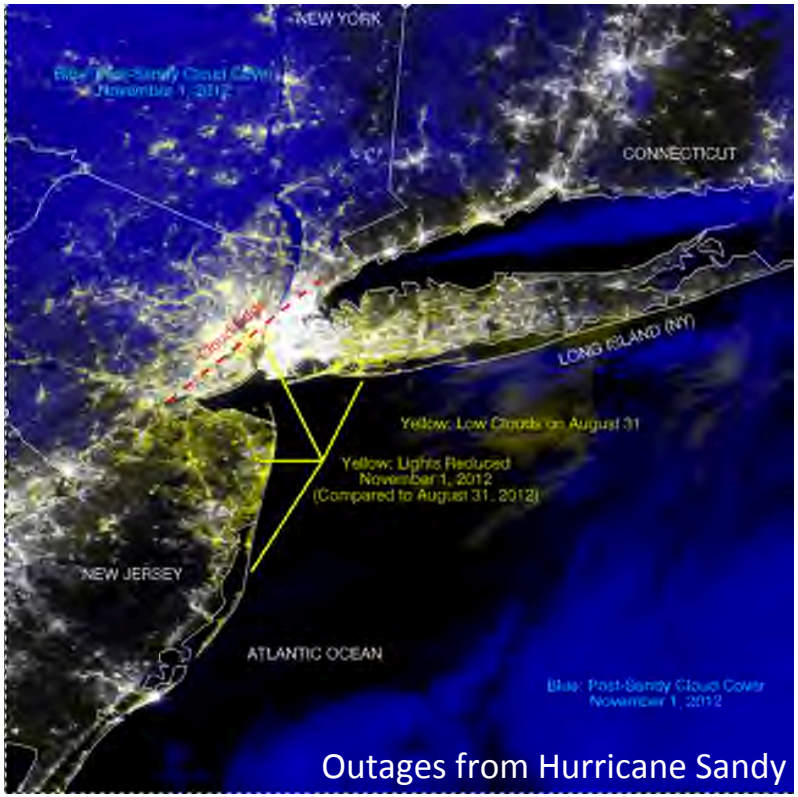
U.S. Drought Monitor
May 8, 2012

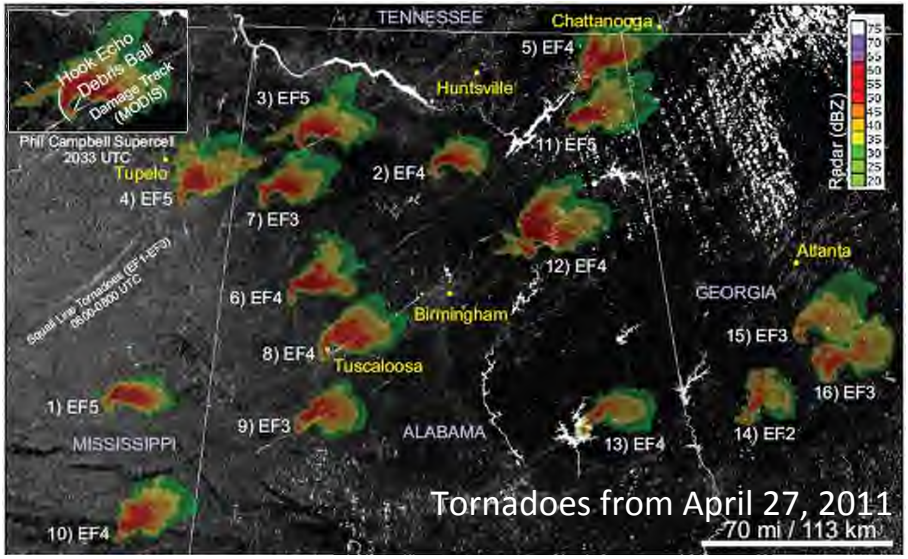
SPoRT uses the Land Information System, which can incorporate observations from SMAP and the Global Precipitation Measurement (GPM) Mission to improve our ability to monitor soil moisture and quantify drought impacts.

NASA Missions and SPoRT Applications



Disaster Applications





VIIRS observations can be used to identify major power outages (left), while MODIS observations can map severe storm damage (right).

SPoRT has developed capabilities to use NASA observations in response to major disasters, providing products, training and support to NOAA/NWS, the Department of Defense, the U.S. Geological Survey, and other end users.

Partnerships with NOAA

National Weather Service
Forecast Offices
and Regional Headquarters

National Centers
for Environmental Prediction

Environmental Modeling Center
National Hurricane Center
Weather Prediction Center
Ocean Prediction Center
Storm Prediction Center

SPoRT provides unique observations and modeling tools for weather forecasting, assisting NOAA partners with their daily forecasting operations.

Partnerships with NOAA

Hydrometeorology Testbed

- Using NOAA and NASA satellites and collaborative models to understand atmospheric rivers and flooding events

Joint Center for Satellite Data Assimilation

- Developing and further improving data assimilation techniques to improve regional weather forecasting

Developmental Testbed Center

- Collaborating on new tools that use NASA and NOAA satellite imagery for model validation

Aviation Weather Testbed

- Providing near real-time satellite imagery and lightning products to aid aviation forecasters

Operations Proving Ground

- Creating new decision support system (AWIPS II) capabilities for next-gen satellites and models

Hazardous Weather Testbed

- Exploring the use of lightning data from ground networks as precursors to GOES-R and ISS capabilities

SPoRT participates in NOAA's Testbeds and Proving Grounds, assisting the meteorological community in development of new applications.

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Partnerships with NOAA

- NASA's MODIS imagers aboard Terra and Aqua are used to develop products that train forecasters for future GOES-R capabilities.
- Lightning data from ground networks prepare forecasters to use GOES-R data in severe weather warnings.

- The Suomi-NPP VIIRS imager extends MODIS capabilities and offer additional training perspectives.
- Atmospheric profiles aid forecasters in data-sparse regoins.
- New capabilities from the day-night band are explored to prepare for operational JPSS missions.

SPoRT provides training and support to weather forecasters, using NASA capabilities to prepare them for the next generation of NOAA operational satellite missions.

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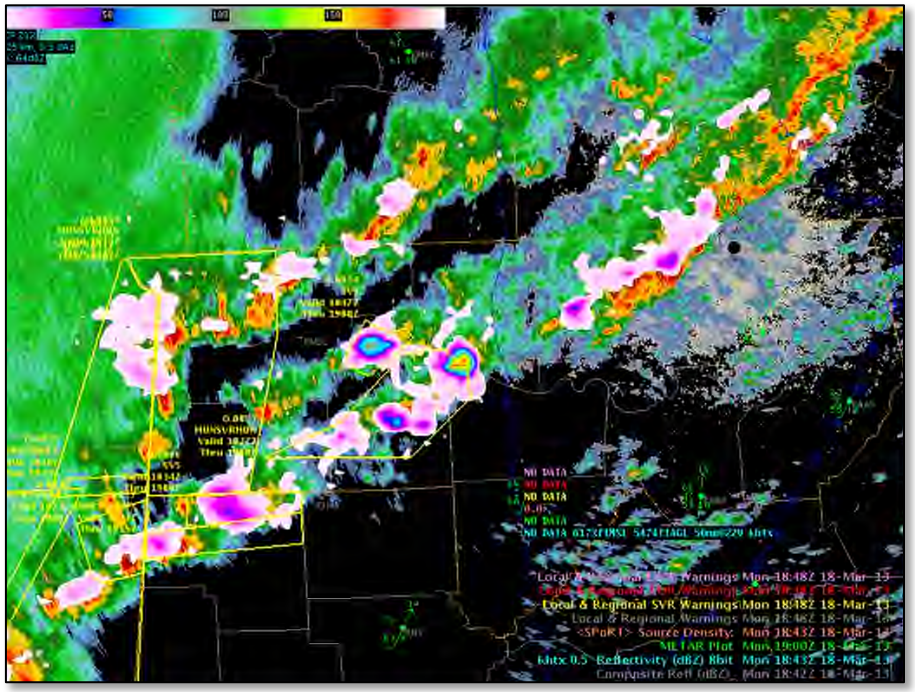
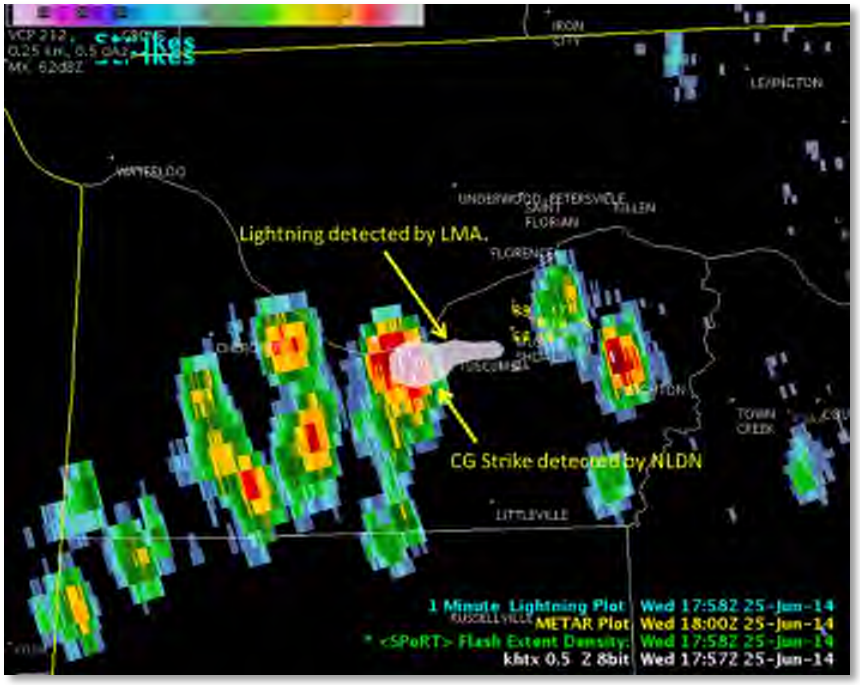
Preparing for GOES-R: Lightning





Lightning observations used to identify most severe and active cells (left), and for additional public safety by identifying lightning activity ahead of isolated storms (right).

SPoRT trains forecasters on the use of total lightning observations from GOES-R, to ensure day-one readiness for severe weather forecasting after launch.

Partnerships with Academia

...and more!

- The University of Alabama in Huntsville, Department of Atmospheric Science, and Earth System Science, each offers numerous opportunities to partner with local researchers and graduate students. The NSSTC facility hosts over 100 "weather enthusiasts" to share in research and development.
- University of Wisconsin, Space Science and Engineering Center, and Cooperative Institute for Meteorological Satellite Studies provide near real-time data to SPoRT and other end users
- Colorado State University, and partners at the Cooperative Institute for Research in the Atmosphere (CIRA) provide near real-time data and partner on algorithm development
- The University of Maryland provides partnerships in data assimilation research and applications with the Cooperative Institute for Climate and Satellites-Maryland (CICS-MD)
- SPoRT works with NASA's Office of Education to sponsor undergraduate internships and post-doctoral scholars.

Summary

- NASA's Short-term Prediction Research and Transition (SPoRT) Center transitions unique NASA and NOAA modeling and observation capabilities to the operational weather forecasting community.
- These activities are supported by strong partnerships between NASA and NOAA, along with numerous academic institutions.
- SPoRT continues to extend capabilities of current NASA and NOAA satellites while looking forward to future capabilities from upcoming NASA missions.